Stress and Autoimmune Disease Susceptibility

Stress has been thought to be a partial cause of autoimmune disease for some time now. As stress is a common effector on other biological processes and can affect mood, health, and even stimulate depression and anxiety, it is something that has the capability to nearly incapacitate those who suffer severely from it. This effect on mood and biological processes can, in turn, negatively affect the immune system by urging the system to recognize foreign invaders when there actually are none.

Common Forms of Stress

Stress is the body’s response to a stressor and triggers the release of excess cortisol and adrenal. This release of hormones stimulates a response in the body which results in a faster heart, quickened breathing, higher blood pressure, and heightened senses/awareness.

Although generally associated with negative feelings, stress is a very important process which allows for a reaction to a dangerous or harmful situation or circumstance. These stress responses trigger what is commonly known as the ancient evolutionary “flight or fight” response, which allows you to determine what the stressor is, and how to deal with it, whether by fighting or fleeing. For example, has anybody ever jumped out and scared you? Most of us will jump and either run, scream, or both. This is your stress response kicking in and reacting, even when our brain has not fully processed what exactly is going on. Although this form of stress is beneficial, and in some cases, even essential to survival, not all forms of stress have positive results. There are three main forms of stress: acute stress, episodic acute stress, and chronic stress.

Acute stress is the form most people generally mean when using the term “stress”. It is the emotional stress, and is commonly associated with quick, abrupt feelings of anger, sadness, or anxiety. It is the feeling you get when you have a test in 2 days that you haven’t begun studying for, or when you’re driving to school and somebody cuts you off for no reason. This form of stress will generally not last more than a few days at the longest. This form of stress is highly common and can be managed easily.

Episodic stress is stress that an individual may not be aware of. Those with episodic stress are often late to appointments or meetings, always feel like they have something going wrong in their lives. They also generally have very competitive and busy personalities. Individuals with episodic stress may genuinely believe they do not have any stress issues and think it is simply their personality or circumstance. This form of stress can result in migraines, high blood pressure, and even heart disease. Intervention is generally needed for progression to recovery with this form of stress as the individual will rarely notice the symptoms on their own. It may be difficult to convince the individual of a need to change, and treatment usually requires the help of a professional.

Chronic stress is the most severe form of stress. It is long term, and a constant feeling of hopelessness over the individual experiencing it. Instead of searching for solutions to problems, an individual with chronic stress will generally just give up on things. This form of stress may stem from something traumatic that occurred early in childhood, or later on in life through the experience of the loss of a loved one. Individuals with this form of stress need intervention and the help of a professional, and commonly also need medications. Individuals with chronic stress frequently suffer from depression as well. This form of stress can result in a heart attack, stroke, violent tendencies, and even suicide.

Autoimmune Disease

Autoimmune disease is the body’s inability to distinguish self from non-self, resulting in the immune system attacking and eliminating healthy, normal cells. This quick response is similar to an allergic reaction in the sense that the immune system suspects a foreign invader when there actually is none, and reacts. A significant difference between these two is that two different T cells (or antibody mediated autoimmune disease) are involved in these processes (CD4+ for allergies, and generally CD8+ in autoimmune diseases), the response for allergies being inflammation, and the response to unrecognized self-molecules, inflammation and targeted cell death. There are more than 100 different kinds of autoimmune disease with the most common being rheumatoid arthritis, systemic lupus, celiac, Addison’s, graves, type 1 diabetes, and psoriasis. Common side-effects for autoimmune disease include fatigue, joint pain, inflammation and fever.

Some autoimmune disease can be treated by certain medications to help alleviate some symptoms, however, almost all of them have no known cure. Since it is an individual’s own body attacking itself, treating the causation would require targeting the specific T cells or antibodies that are unable to recognize self-versus non-self. As this is currently not possible, suppressants are commonly prescribed which dampen the effects of these rebel cells. Autoimmune disease can be genetically acquired, but it can also stem from other factors. As inflammation is commonly associated with autoimmune disease, many physicians recommend avoiding food that may contain a high sodium content, and any other grocery item that may induce inflammation.

Autoimmune Disease and Stress – The Link

Stress triggered hormones which can lead to the dysregulation of the immune system can cause alteration or increased proliferation of pro-inflammatory cytokines. Pro-inflammatory cytokines are cells in the body which are involved in an immune response, and are a crucial component for the regulation of inflammatory responses in the body, however, this excess production or change of cytokines confuses other regions of the immune system, resulting in attacks and elimination of self-molecules. This increases the likelihood of more stress hormone release, and the cycle continues.

Summary

Stress may seem a common aspect of life, but recognition of healthy stress in comparison to unhealthy and potentially dangerous stress is important in order to minimize negative health effects. As discussed, many forms of autoimmune disease are believed to be partially derived from excess stress levels. If stress levels are recognized and controlled in an individual, it could potentially reduce the risk of obtaining an autoimmune disease as well as decrease chances of heart attacks, strokes, and risk of depression.

This topic is especially important today due to the fact that such a large portion of these autoimmune diseases still do not have a known cure. If stress is such an involved factor in the onset and progression of autoimmune disease, it could be inferred that a mixed treatment of suppressants as well as therapy for controlling stress could be beneficial and potentially decrease symptoms. According to research, up to 80% of patients with autoimmune disease report enormous amounts of stress before diagnosis of the disease. This further suggests a link between autoimmune disease and stress. Future research could include mixed treatment to observe if it benefits patients.

References

Conditions & Health. (n.d.). Retrieved from https://www.hopkinsmedicine.org/health/healthy-woman/conditions/what-are-common-symptoms-of-autoimmune-disease<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3189547/>

Conditions & Health. (n.d.). Retrieved from <https://www.hopkinsmedicine.org/health/healthy-woman/conditions/autoimmune-disease-why-is-my-immune-system-attacking-itself>

Immunopaedia. (n.d.). Retrieved from <https://www.immunopaedia.org.za/immunology/advanced/9-t-cell-mediated-autoimmune-diseases/>

Stojanovich, L., & Marisavljevich, D. (2008, January). Stress as a trigger of autoimmune disease. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/18190880>

Stress as a trigger of autoimmune disease. (2007, November 29). Retrieved from <https://www.sciencedirect.com/science/article/abs/pii/S156899720700170X?via=ihub>

Stress [symptoms](http://www.citationmachine.net/bibliographies/421139826?new=true), Signs, and Causes. (2019, February 22). Retrieved from <https://www.helpguide.org/articles/stress/stress-symptoms-signs-and-causes.htm/>

What are some of the most common autoimmune diseases? • AARDA. (2017, May 05). Retrieved from <https://www.aarda.org/knowledge-base/common-autoimmune-diseases/>